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Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

**“पुराने को छोड़ नये के तरफ”**

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 3702 (1989): Refills for vacuum flasks [CHD 10:  
Glassware]

**“ज्ञान से एक नये भारत का निर्माण”**

Satyanaaranay Gangaram Pitroda

Invent a New India Using Knowledge



**“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”**

Bhartṛhari—Nītiśatakam

“Knowledge is such a treasure which cannot be stolen”





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**IS 3702 : 1989**  
( Reaffirmed 2006 )

*Indian Standard*  
**REFILLS FOR VACUUM FLASKS —  
SPECIFICATION**  
*( Second Revision )*

भारतीय मानक  
निर्वात फ्लास्क के रीफिल – विशिष्ट  
( दूसरा पुनरीक्षण )

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First Reprint NOVEMBER 1999

UDC 666.171.8 : 641.546.2

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

## FOREWORD

This Indian Standard ( Second Revision ) was adopted by the Bureau of Indian Standards on 16 August 1989, after the draft finalized by the Glassware Sectional Committee had been approved by the Chemical Division Council.

This standard was originally published in 1966 and revised in 1975 to meet the requirements of domestic and foreign markets. The main objective was to specify more realistic values for heat retention capacity and a wider range of nominal capacities of refills. In this revision, the need of the foreign buyers for mouth blown and not machine blown shells has been taken into consideration. Wider tolerances for capacity have been introduced to take care of frequent change in the shapes, sizes and designs without compromising performance of the refills. Types have been increased from three to six. Limit of alkalinity has been modified and values for nominal capacity have been kept open. Heat retention capacity test procedure has also been modified in line with the prevailing practices.

Requirements for vacuum flasks have been covered separately in IS 7708 : 1975 Specification for vacuum flasks.

This standard contains clauses **5.1, 7.2, 7.5, 7.5.1, 7.6** and **8.2** which provide for agreement between the purchaser and the manufacturer.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

**AMENDMENT NO. 1 JANUARY 2006**  
**TO**  
**IS 3702 : 1989 REFILLS FOR VACUUM FLASKS—**  
**SPECIFICATION**  
*( Second Revision )*

( *Page 1, clause 2* ) — Substitute the following for the existing clause:

**'2 REFERENCES**

The standards listed below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1382 : 1981	Glossary of terms relating to glass and glassware ( <i>first revision</i> )
2303 (Part 1/ Sec 1) : 1994	Grading glass for alkalinity : Part 1 Hydrolytic resistance, Section 1 Hydrolytic resistance of glass grains at 98°C — Method of test and classification ( <i>first revision</i> )
7708 : 1975	Specification for vacuum flasks'

( *Page 2, clause 7.3* ) — Substitute the following for the existing clause:

**'7.3 Limit of Alkalinity**

The glass of the refills shall conform to Class HGB 3 of the glass when graded according to the method prescribed in IS 2303 (Part 1/ Sec 1).'

( CHD 10 )

# *Indian Standard*

## REFILLS FOR VACUUM FLASKS – SPECIFICATION

### *(Second Revision)*

#### **1 SCOPE**

**1.1** This standard ( Second Revision ) prescribes the requirements and methods of sampling and tests for refills for vacuum flasks.

#### **2 REFERENCES**

**2.1** The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
IS 1382 : 1981	Glossary of terms relating to glass and glassware ( <i>first revision</i> )
IS 2303 : 1963	Method of grading glass for alkalinity
IS 7708 : 1978	Specification for vacuum flasks

#### **3 TERMINOLOGY**

**3.1** For the purpose of this standard, the definitions given in IS 1382 : 1981 in addition to the following shall apply.

#### **3.2 Vacuum Flask**

Vacuum flask is a composite container consisting of an outer protective case provided with a closure and suitable means for its carrying. The outer case shall house a stoppered, double-walled glass container ( called the refill ), with the inner and outer walls silvered and the intervening space maintained under vacuum to reduce to a minimum the transfer of heat to and from the contents placed in it.

#### **4 TYPES**

**4.1** The refills for vacuum flasks shall be of the following six types:

a) *Type A*

Narrow mouth, nominal capacity greater than 750 ml and internal mouth diameter up to 45 mm.

b) *Type B*

Narrow mouth, nominal capacity greater than 250 ml but less than 750 ml and internal mouth diameter up to 45 mm.

c) *Type C*

Wide mouth, nominal capacity 500 ml and above and internal mouth diameter above 45 mm.

d) *Type D*

250 ml nominal capacity and internal mouth diameter up to 30 mm.

e) *Type E*

250 ml nominal capacity and internal mouth diameter above 30 mm but up to 45 mm.

f) *Type F*

Other types of refills meant for use as tumblers, ice-bowls, etc.

#### **5 SHAPE, SIZE AND NOMINAL CAPACITY**

**5.1** The shape, size and nominal capacity of the refill shall be as agreed to between the purchaser and the manufacturer. However, the nominal capacity of the refills shall be declared by the manufacturer.

#### **6 SIZE DESIGNATION**

**6.1** The size designation of the refills shall be expressed by the type, nominal capacity and internal mouth diameter in millimetres, separated by oblique-strokes.

*Example*

A refill of Type B, of 500 ml nominal capacity having internal mouth diameter of 45 mm shall be designated as B/500/45.

#### **7 REQUIREMENTS**

##### **7.1 Workmanship and finish**

The refills shall be made of well-annealed glass, uniform in shape, symmetrical about their axis and smoothly finished.

**7.1.1** The silvering shall be uniform and free from flakes.

**7.1.2** The spacers, if any, shall not be loose.

## 7.2 Brimful Capacities

Unless otherwise agreed to between the purchaser and the manufacturer, the brimful capacities of refills of corresponding nominal capacities shall be as follows:

<b>Nominal Capacity ml</b>	<b>Brimful Capacity ml</b>
250	250 + 50 - 30
500	500 + 70 - 50
750	750 + 80 - 50
1 000	1 000 + 120 - 50
1 500	1 500 + 150 - 70

**7.2.1** The nominal capacities and their tolerances of other varieties of refills shall be as agreed to between the purchaser and the manufacturer.

## 7.3 Limit of Alkalinity

When graded according to the method prescribed in IS 2304 : 1963, it shall conform to Type 4 of the glass.

## 7.4 Resistance to Thermal Shock Test

The refills shall pass the test prescribed in Annex A.

## 7.5 Heat Retention Capacity

The temperature of water heated to 95°C and kept in refills, in accordance with the method prescribed in Annex B when measured at intervals of 1, 24 or 5 hours respectively, shall be not less than the following:

<b>Type of Refills</b>	<b>Temperature Attained Not Less than (°C)</b>		
	<b>After 1 hour</b>	<b>After 24 hours</b>	<b>After 5 hours [ Alternative to col (3) ]</b>
(1)	(2)	(3)	(4)
A	91	50	78
B	88	42	70
C	85	42	70
D	88	40	70
E	85	38	68
F	As agreed to between the purchaser and the manufacturer		

**7.5.1** For routine testing, the refills shall be tested for 1 hour and 5 hour test. For 24 hour heat retention test, it shall be as agreed to between the purchaser and the manufacturer.

NOTE – If the sample of vacuum flasks fails in heat retention capacity test when subjected to 5 hours test, an option may be exercised by testing an equal number of flasks for 24 hours test. The lot shall be considered acceptable if all the samples subjected to 24 hours test pass the test.

## 7.6 Dimensions and Designs

The dimensions and designs of refills shall be as agreed to between the purchaser and the manufacturer.

## 8 PACKING AND MARKING

### 8.1 Marking

The packages shall be marked with the following:

- a) Name of the material;
- b) Type, nominal capacity and internal mouth diameter (Size designation);
- c) Manufacturer's name or his recognized trade-mark, if any; and
- d) Lot number/date of manufacture to enable the batch of manufacture to be traced from records.

### 8.2 Packing

The refills shall be packed in suitable packages, to ensure safety in handling and transport, as agreed to between the purchaser and the supplier.

## 9 SAMPLING

**9.1** The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Appendix A of IS 7708 : 1975.

## ANNEX A

*( Clause 7.4 )*

### TEST FOR RESISTANCE TO THERMAL SHOCK

#### **A-0 GENERAL**

**A-0.1** The test is carried out by pouring water at  $27 \pm 2^\circ\text{C}$  into the refill, emptying it and then pouring boiling water in it followed again by water at  $27 \pm 2^\circ\text{C}$ .

#### **A-1 PROCEDURE**

**A-1.1** Hold the refill vertically in a suitable manner and pour into it water having a temperature of  $27 \pm 2^\circ\text{C}$  up to its neck. Allow to

stand for 3 minutes. Then empty the refill and immediately fill it to the same level with boiling water and allow to stand for 3 minutes. Again empty the refill and immediately pour water having a temperature of  $27 \pm 2^\circ\text{C}$  and allow to stand for 3 minutes. The time taken in pouring water in and out shall not exceed 15 seconds.

**A-1.2** The refill shall be taken as having satisfied the requirement of this test if it does not suffer any damage.

## ANNEX B

*(Clause 7.5)*

### TEST FOR HEAT RETENTION CAPACITY

#### **B-0 GENERAL**

**B-0.1** The heat retention capacity of a refill is determined by filling hot water at  $95^\circ\text{C}$  in it in the manner prescribed below and measuring the temperature of water at intervals of 1, 5 or 24 hours, respectively.

#### **B-1 PROCEDURE**

**B-1.1** Rinse the refill with boiling water, draining out as much of water as possible. Quickly fill it up to the neck with boiling water. Allow the temperature to drop slowly

to  $95^\circ\text{C}$ , close the mouth with the stopper and note the time. Note the temperature of water in the refill at the end of 1, 5 or 24 hours respectively from the time the water in the refill attained the temperature of  $95^\circ\text{C}$ .

NOTE — In no case shall the refill be disturbed or opened except for measuring the temperature as stated above.

**B-1.2** The refill shall be taken as having passed the test if the temperatures measured at the end of 1, 5 or 24 hours are not less than those specified in 7.5.

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This Indian Standard has been developed from Doc: No. CDC 10 ( 9322 )

### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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